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## EIGHT YEARS OF EXTENSION PREDATOR-CONTROL IN MISSOURI\*

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Background

Missouri, like many states, has always had to cope with complaints of livestock and poultry damage caused by wild animal predators. These are mainly foxes and coyotes (often called "wolves" in Missouri). Warfare was legislated against wolves, coyotes, and bobcats as early as 1825 in the form of allowing counties to pay bounties on these animals. Custom and tradition have caused this bounty principle to be maintained. Paradoxically, the tradition of fox chasing in Missouri has kept tax money from being wasted on a bounty for foxes.

The bounty didn't stifle farm damage complaints and, between 1923 and 1946, the federal government salaried-trapper system was added and given three good tries, totaling about 14 years. Farmers still were not satisfied, and a state hunter with dogs was also tried during 1944 and 1945 to reach the many complainers that the half-dozen government trappers could not get to quickly enough. For various reasons, including costs, delays, and failure to reduce damage for enough farmers, the complaints continued with little abatement until both of these programs were abandoned. The bounty system, however, was retained.

The present extension predator-control program for farmers, begun in 1945, is a development of certain aspects of the old government trapper system. It became evident that the most successful government trappers were those who responded most promptly to calls from farmers; such men usually found the predators present and active. Promptness was not possible when one man undertook to do all the trapping, but by working closely with a farmer the trapper could often establish a workable trapline in a day or two, showing the farmer how to locate good sites and make good sets. The trapper could then move to other damage areas and repeat the process. Often upon his return to the first area the farmer had made a catch; if not, the farmer usually had a good idea where the animals were ranging, and this saved the trapper time in helping the farmer relocate the traps. From this procedure

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\* The development and application of simplified trapping techniques by Missouri Conservation Commission extension trappers, Lewis J. McIntosh and Robert H. Smith, has been a major contribution in carrying out this program. Mail survey data were obtained by predator-control supervisors, Allen Brohn for fiscal 1952 and 1953, Reed Twichell for 1951, and the author for 1946-1950. Cooperation of the U.S. Fish and Wildlife Service was instrumental in the initial organization of the program.







it was found that farmers could learn how to trap as easily as learning other farm jobs and that concentration of trapping in a damage area was the most practical way of catching individual animals actually doing the killing. Thus, came the idea of helping farmers to help themselves, which is at the root of all agricultural extension service.

### Organization and Operation

Extension predator-control was started in Missouri in September 1945, when one extension trapping instructor was employed jointly by the Missouri Conservation Commission and the U.S. Fish and Wildlife Service, with supervision by the latter agency. A second extension trapping instructor was added in February 1947, and both men have been employed steadily since then, occasionally performing other duties. The Missouri Conservation Commission assumed supervision of the program in July 1947, and all costs in July 1951.

One extension trapper is headquartered and operates mainly in the northern half of Missouri, the other in the southern half of the state. Supervision and scheduling are handled by an administrative biologist in the Game Section. Both extension trappers had been previously employed as U.S. Fish and Wildlife Service trappers and, with their background of farm experience, are able to demonstrate trapping techniques in a way that is accepted by farmers. Their ability to discuss predation and other wildlife relationships, in terms that reflect farmers' thinking, has contributed importantly to the friendly reception accorded the program.

At the outset of the program a working agreement was arranged with the Missouri Agricultural Extension Service. This brought in the county agricultural agents who may act as local clearing-houses for requests from farm groups for predator-control assistance. It also helped to establish the program as essentially a service for farmers furnished by the State's wildlife agency in recognition of an opportunity to cooperate with landowners.

County agricultural agents usually organize requests from interested farm groups. They arrange with the Missouri Conservation Commission predator-control supervisor for local training on a scheduled date, and announce meetings and demonstrations. The activities of the extension trappers may be integrated with other local agricultural projects, if desired. Occasionally, individuals or wildlife conservation agents may initiate requests, sometimes directly to the extension trappers.

Depending upon the amount of interest and the local damage situation, the county agricultural agent may provide for a general meeting in his county scheduled at the fore part of the week. Attendance at these meetings runs from a handful to 100 or more people. If only a few farmers are affected, the meeting is combined with the field demonstrations.







Where a meeting is held, a fairly comprehensive coverage of essential information is presented by the extension trapper. During such a meeting, arrangements are made to conduct a series of field training demonstrations for smaller groups during the remainder of the week, preferably on farms where damage is occurring or where predators are currently active. Each field demonstration may require from one-half day to two or three days, depending upon local conditions. Field work may be conducted with one or two men; in some cases, 25 to 30 have participated.

Much of the material which can be covered only briefly in meetings is demonstrated in detail in the field insofar as conditions of weather and season may allow. Trapping techniques are shorn of old superstitions and are simplified to essential requirements to fit in with the pace of modern farming. The farmers make most of the trap sets themselves, under the direction of the extension trappers. If the predators are active, the traps are left set and, under favorable conditions, a catch may be made by at least one farmer during the week -- sometimes the first night. About one out of seven farmers may have difficulty getting the traps located effectively, and in all such cases follow-up assistance is given when requested.

Whether a meeting is held or only field training is conducted, the extension trapper emphasizes subject matter of most timely local interest, along with necessary information and "know-how" included under the following subjects:

1. Purpose of the program and sponsoring agencies.
2. Explanation of normal beneficial predation, as distinguished from individual predators that may cause livestock and poultry losses.
3. Characteristics and life history of coyotes and foxes, as background information necessary to successful trapping for damage reduction.
4. Trapping compared to other methods as the most practical and dependable method for Missouri farmers to use.
5. Trapping equipment required and where obtainable.
6. Selecting good trap locations and how to utilize various kinds of animal sign to accomplish this.
7. How to make effective trap sets.
8. Variations in trap sets for coyotes and foxes.
9. Trapping parents and pups during the denning and rearing season.







10. Winter and frozen ground trap sets.
11. Using various types of scent, manufactured and home-made.
12. Precautions to be followed in farm trapping for the least harm to beneficial wildlife and dogs and to maintain the good-will of neighbors.

Requests for trapping instructions have come from an average of about 50 counties per year throughout the State, requiring around 80 meetings and series of demonstrations. (Table 1) All counties requesting extension trapper service have received it, usually within two weeks. Promptness of response is essential if the public is to be satisfied. Under the old government trapper system, a county often had to wait several months, if indeed it received assistance at all. Actually, only 43 per cent of the counties requesting government trapper service ever did get it, because the few trappers, doing all the work themselves, could visit only a fraction of the areas from which complaints were received. Also, some counties were reluctant to relinquish a government trapper once he was assigned, and others would complain of costs and ineffectiveness. (Sampson & Bennitt 1947-48). Prompt and effective action under the extension program has reduced the number of complaints received by the Conservation Commission almost to zero.

During the past eight years nearly 16,000 farmers and other interested people in most parts of the State have attended some 635 demonstration meetings. Following the meetings, training in the field has been received by more than 5,800 men (and a few women), mostly farmers. Thus, nearly two-thirds of the people interested in the predator damage problem, and who constitute a potential source of complaints, have been satisfied merely by attending a meeting where they can acquire a fuller understanding of what predation really is and what is required to reduce farm damage. Of the 5,800 taking the field trapping instruction, a majority used their training at some time, and 873 required individual follow-up training on their farms in order to achieve damage reduction. (Table 1)

Each of the two extension trappers is equipped with a 16 mm. sound movie projector, a 2x2-inch slide projector, projection screen, and a 35-mm. camera. This allows the use of movies and slides on predator habits and control methods, and adds considerable interest to rural meetings. A 15-minute sound and color movie, "Wolf Medicine," produced by the Missouri Conservation Commission in 1949, depicts coyote habits and trapping methods. The extension trappers have used the cameras to build up two collections of about 80 color slides each, which cover a fair share of the questions brought up by farmers. These are particularly







useful in illustrating techniques that may not be demonstrated in the field at a certain time, due to weather or seasonal conditions. An illustrated 20-page bulletin, "Controlling Coyote and Fox Damage on the Farm," contains many of the techniques demonstrated and is made available especially for those participating in the field training.

In order to provide suitable traps in a damage area for immediate use, where farmers cannot find them locally, a minimum number of No. 3-N Victor offset jaw traps are made available at near cost through a revolving Predator-Control Fund. This fund is sponsored by the Missouri Sheep and Wool Growers Association and was set up when the program was first begun. The fund was allowed a small margin of solvency in trap price, and this eventually provided the much-needed 35-mm. cameras, film, and 2 x 2-inch slide projectors.

In the 8-year period the Predator-Control Fund made available 4,729 traps, equipped with a specially constructed drag-hook for each pair of traps, to 1,361 farmers (Table 1). This averaged 591 traps to 170 farmers per year. The service has been sufficient to get farmers started where the damage situation was acute and gave them time to order additional traps from mail-order firms or fur-houses.

Scent bait, a very high priority item in demonstration and starting off farmers in trapping, was volunteered by the National Scent Company, of Chilhowee, Missouri. This scent, made from natural coyote urine, is put up in one-half ounce sample bottles and is given to each farmer who takes the field training and who plans to start trapping. Some farmers purchase more scent when needed and others collect it from caught animals.

The rural public is kept informed of the program through newspaper releases, farm magazines, and farm and wildlife radio programs. The extension trappers are often scheduled for demonstrations at Farm Day activities, 4-H Club and FFA summer camps, vocational agriculture classes, and exhibits at regional fairs and the State Fair.

### Results of the Program

Probably the most outstanding change noted since the extension trapping program was begun has been the almost complete elimination of loud complaints for "somebody to do something" about foxes and coyotes killing poultry and livestock. Instead, this cry has tempered to requests for training assistance. Most farmers seem to appreciate recognition that they can learn trapping for damage reduction as easily as learning how to spray for insect-control, and they accept the challenge. Also, it is human nature for most people to be far more satisfied with their own work than with a job done for them by someone else. Certainly they can realize that they are in the best position to apply immediate predator-control on their farms whenever needed, and it makes sense to them for the State's wildlife agency to show them how to do it.







Occasionally a trainee who shows special interest and aptitude is recognized by his neighbors as possessing a little more ability in predator trapping, and they may call upon him to help them out on a trade-work basis. This principle has been carried further: in large communities farmers have formed associations of paying members and have hired one of their number to do all the trapping during spring and fall months when most damage usually occurs and when trapping is most effective. This has generally worked out better on a salary basis than on a "per predator" basis, because the former encourages trapping for damage reduction even where animals may be relatively scarce. The extension trappers have rendered valuable service through improving the efficiency of such local farm trappers, and in advising communities desiring a similar arrangement as to the best ways and means of accomplishing their purpose.

It is, of course, impossible to check personally all farmer trainees to find out what they have accomplished; so annual mail surveys were made of persons who participated in field training. Over the eight years, an average of 24 per cent of these people furnished information. This is representative only of those replying; no attempt is made to expand the sample.

The information received is broken down by years in the accompanying tables: it is probably sufficient here to consider only the over-all 8-year picture. Out of 1,877 replies, 1,114 (59%) reported making 10,195 predator catches, - or an average of slightly over nine predators each. The predator catch was composed of 30.4 per cent coyotes, 53.4 per cent red foxes, 15.3 per cent gray foxes, 0.6 per cent bobcats, and 0.3 per cent wild dogs. (Table 2) Incidentally, it was found that, once farmers had learned how to trap, they were not reluctant to apply their learning whenever damage threatened again. Also, when the offending animal was caught and damage ceased, they would take up their traps.

To the query of how many hours they spent in trapping, 1,110 farmers reported a total of 55,209 hours, - or an average of 49.7 hours each. Considering the number of predators caught, an average of 5.4 hours trap-tending was required to catch each predator. The average time for coyotes alone was 17.8 hours per coyote. (Table 3) This is nearly 3-1/3 times as efficient as the government trappers were in Missouri. The government trappers averaged 60.3 hours per coyote catch over a 10-year period, between 1936 and 1946 (Sampson & Bennitt 1947-48). Since the population of coyotes has not changed enough to account for this difference, the increased efficiency is probably due mainly to the fact that farmers do not need to spend time traveling to the trapping area and generally have a pretty good idea as to where the animals are ranging.

In order to find out how much actual damage reduction farmers thought they were accomplishing for themselves, they were asked to report their losses for the year prior to trapping and for the year after trapping. Although their judgment may not be entirely accurate, their opinion is very important in gauging public relations value of the program. Also, farmer appraisal is likely to be conservative. This information has been collected for each of the past six years. Where numbers of head of different kinds of livestock







and poultry were reported, they were evaluated in terms of dollars, for comparative purposes, based on 1948 figures from the University of Missouri College of Agriculture.

For the 6-year period, 816 farmers reported annual losses before trapping totalling \$101,679; and for the year after instituting damage-control, \$19,774. The resulting saving of \$81,905 is an over-all damage reduction averaging 81 percent for the period. Each of the six years also shows reduced losses ranging from 72 per cent to 88 per cent. It is interesting to note that the reduction in evaluated losses produce an annual saving averaging \$100.37 per farmer (Table 4). Considering that the average farmer trainee puts in 49.7 hours to achieve this saving (Table 3), his trapping effort is worth about \$2.00 an hour to him.

### Summary

1. Compared to other methods tried, extension predator-control provides the best system of providing sufficiently prompt and immediately effective service to all requests for farm predator damage assistance. Also, once farmers are trained, they can apply control measures at any time needed.

2. Simplified trapping techniques designed for busy farmers and demonstrated by extension trappers with suitable ability have been important contributions to the effectiveness of the program.

3. Average annual damage reduction of 81 per cent, amounting to \$100.37 per farmer of 816 reporting, has been attained over a 6-year period by farmers who applied their training. They indicate that they are well-satisfied with this result.

4. During eight years, 635 demonstrational meetings have been requested and conducted throughout the State, arranged usually through county agricultural agents. These have been attended by nearly 16,000 interested farm people, and 5,800 of these have participated in field training, with 873 farmers given individual follow-up assistance.

5. From annual mail surveys during an 8-year period, over 1,100 farmers reported an average of 49.7 hours per year spent in trapping an average of 9.2 predators each. The total reported catch for fiscal 1946-1953 was 10,195 predators (3,099 coyotes, 5,444 red foxes, 1,555 gray foxes, 66 bobcats, and 31 wild dogs).

### References

- Sampson, F.W., and R. Bennitt. Ways and Means in Wolf-Coyote-Bobcat Control. 1947-48. Missouri Conservationist, Dec. 1947 and Jan. 1948.
- Sampson, F.W., and W.O. Nagel. Controlling Coyote and Fox Damage on the Farm. 1948. Missouri Conservation Commission bulletin.

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TABLE 1. EXTENSION PREDATOR-CONTROL ACTIVITIES

Fiscal Year	No. Counties: Requesting Service	No. of Demonstrations: Meetings	No. of Farmers Participating at Meetings	in Field Training	Follow-up Assistance	Predator-Control Fund Trap Distribution: No. Farmers	No. Traps
1946	29	33	100	88	17	50	412
1947	43	78	650	421	50	129	554
1948	62	90	1,815	965	111	250	760
1949	53	94	1,781	908	140	205	676
1950	50	90	3,841	975	176	191	570
1951	54	81	2,243	815	157	208	668
1952	50	85	2,124	756	110	170	541
1953	48	84	3,158	874	112	158	548
Total	50	635	15,712	5,802	873	1,361	4,729
	Annual Avg.						

TABLE 2. PREDATOR CATCH REPORTED (1)

Fiscal Year	No. of Farmers Reporting Catches	Number of Predators Trapped						Average Catch per Farmer
		Red Coyote	Gray Fox	Bob-cat	Wild Dog	Total		
1946	30	80	21	27	1	129	4.3	
1947	114	473	526	157	9	1,174	10.3	
1948	187	622	756	322	10	1,720	9.2	
1949	243	682	1,118	301	17	2,124	8.7	
1950	148	426	645	200	13	1,284	8.7	
1951	128	329	597	168	10	1,106	8.6	
1952	163	313	1,116	212	5	1,648	10.1	
1953	101	174	665	168	1	1,010	10.0	
Total	1,114	3,099	5,444	1,555	66	10,195	9.2	Avg.

(1) Data from annual mail survey of farmers who had received field training, as follows:

Fiscal year	1946	1947	1948	1949	1950	1951	1952	1953	Total
Questionnaires mailed	88	413	1,391	2,271	975	997	942	729	7,806
Replies returned	38	150	334	477	236	222	265	155	1,877
Per Cent replying	43%	36%	24%	21%	24%	22%	28%	21%	24%







(1)  
TABLE 3. TRAPPING TIME REPORTED AND HOURS PER PREDATOR

Fiscal Year	:No.Farmers:		: Total		: Average Number	
	Reporting : <u>Number of Trapping Hours</u>		Predators		Trapping Hours	
	Trapping	Total Hours	Average	Trapped	per	Predator
	Time	Reported	:per Farmer			
1946	30	1,973	65.8	129	15.3	
1947	120	7,233	60.3	1,174	6.2	
1948	189	11,083	58.6	1,720	6.4	
1949	248	15,417	62.2	2,124	7.3	
1950	143	6,008	42.0	1,284	4.7	
1951	134	3,812	28.4	1,106	3.4	
1952	144	5,939	41.2	1,648	3.6	
1953	102	3,744	36.7	1,010	3.7	
Total	1,110	55,209	49.7	10,195	5.4	

(1)  
TABLE 4. REDUCTION IN LIVESTOCK AND POULTRY LOSSES REPORTED

Fiscal Year	:No.Farmers:		Annual Losses*		Reduction		Per Cent		Avg. Saving in	
	Reporting : Before		After		in Annual		Reduction		Annual Loss	
	Losses	Trapping	Trapping	Losses	in Losses	in Losses	in Losses	per	Farmer	
1948	172	\$ 29,968	\$ 4,619	\$ 25,349	85%	\$ 147.38				
1949	220	28,008	5,834	22,174	79%	100.79				
1950	113	12,766	2,551	10,215	80%	90.40				
1951	115	8,654	2,400	6,254	72%	54.38				
1952	128	15,322	3,522	11,800	77%	92.19				
1953	68	6,961	848	6,113	88%	89.90				
Total	816	\$101,679	\$ 19,774	\$ 81,905	81%	\$ 100.37				

(1) See footnote (1) on preceding page.

\* Number of head of livestock and poultry was evaluated from 1948 information from University of Missouri College of Agriculture.





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